

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

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A3 Claim 1 (currently amended): A detection system for a bio-separation device having a plurality of separation channels in which bio-separation takes place simultaneously, comprising:  
a detection section along each separation channel defining a detection zone for analytes;  
a plurality of radiation sources, each associated with a one of said separation channels;  
excitation means for introducing excitation radiation from the radiation sources at the detection zones as analytes pass the detection zones;

detecting means for detecting radiation emissions;

control means for controlling the radiation sources and detecting means in a manner such that excitation radiation is introduced at the detection zone of each separation channel in a predetermined sequence and radiation emission from the detection zone of each separation channel is detected in a time staggered/multiplexed manner.

Claim 2 (currently amended): The detection system as in claim 1, wherein the detecting means comprises a single detector associated with a said plurality of radiation sources.

Claim 3 (currently amended): The detection section as in claim 1, wherein the control means controls the plurality of radiation sources to activate in successive pulses ~~between~~ with respect to the radiation sources.

Claim 4 (currently amended): The detection section as in claim 3, wherein the control means controls the synchronization of pulsing of the radiation sources and detection sampling

rate and period by taking into account the lag time in emitted radiation in adjacent separation channels, whereby desired detection for a one of said separation channels covers a period when only the associated radiation source is on with respect to the detecting means.

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Claim 5 (currently amended): The detection system as in claim 4, wherein the control means controls the detecting means to sample the radiation emissions from the multiple separation channels at a rate and period that provide desired radiation emission signal separation between the separation channels to reduce cross talk.

Claim 6 (currently amended): The detection system as in claim 1, wherein the control means controls the detecting means and radiation sources in a manner to effect the detection of radiation emissions from the multiple separation channels in predetermined detection cycles, wherein each detection cycle is repeated at a frequency to provide a desired detection resolution.

Claim 7 (Original): The detection system as in claim 1, wherein the control means controls the radiation sources and detecting means in a manner to effect detection in a repeated scanning manner, across the detection zones of the separation channels.

Claim 8 (currently amended): The detection system as in claim 1, wherein the radiation sources produces said excitation radiation at more than one wavelength.

Claim 9 (Original): The detection system as in claim 1 wherein the analytes comprise a material that fluoresces in the presence of the excitation radiation, and the detecting means comprises means for detecting fluorescence emission of the material.

Claim 10 (Original): The detection system as in claim 1 wherein the radiation emission is at least one of:

fluorescence;

chemiluminescence; and

phosphorescence.

Claim 11 (currently amended): A bio-separation instrument, comprising:

a plurality of separation channels;

means for simultaneously separating samples in the separation channels into analytes;

and

a detection system, comprising:

a detection section along each separation channel defining a detection zone for analytes;

a plurality of radiation sources, each associated with a one of said separation channels;

excitation means for introducing excitation radiation from the radiation sources at the detection zones as analytes pass the detection zones;

detecting means for detecting radiation emissions;

control means for controlling the radiation sources and detecting means in a manner such that excitation radiation is introduced at the detection zone of each separation channel in a predetermined sequence and radiation emission from the detection zone of each separation channel is detected in a time tagged/multiplexed manner.

Claim 12 (Original): A bio-separation instrument as in claim 11, wherein the separation channel is defined by a capillary column, and the means for separating a sample is configured to effect separation of the sample by electrophoresis.

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Claim 13 (currently amended): A method for detecting analytes in a bio-separation device having a plurality of separation channels in which bio-separation takes place simultaneously, comprising the steps of:

defining a detection zone for analytes along each separation channels;

providing a plurality of radiation sources, each associated with a one of said separation channels;

introducing excitation radiation from a plurality radiation sources at the detection zones as analytes pass the detection zones;

providing a detector for detecting radiation emissions;

controlling the radiation sources and detector in a manner such that excitation radiation is introduced at the detection zone of each separation channel in a predetermined sequence and radiation emission from the detection zone of each separation channel is detected in a time staggered/time-multiplexed manner.

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